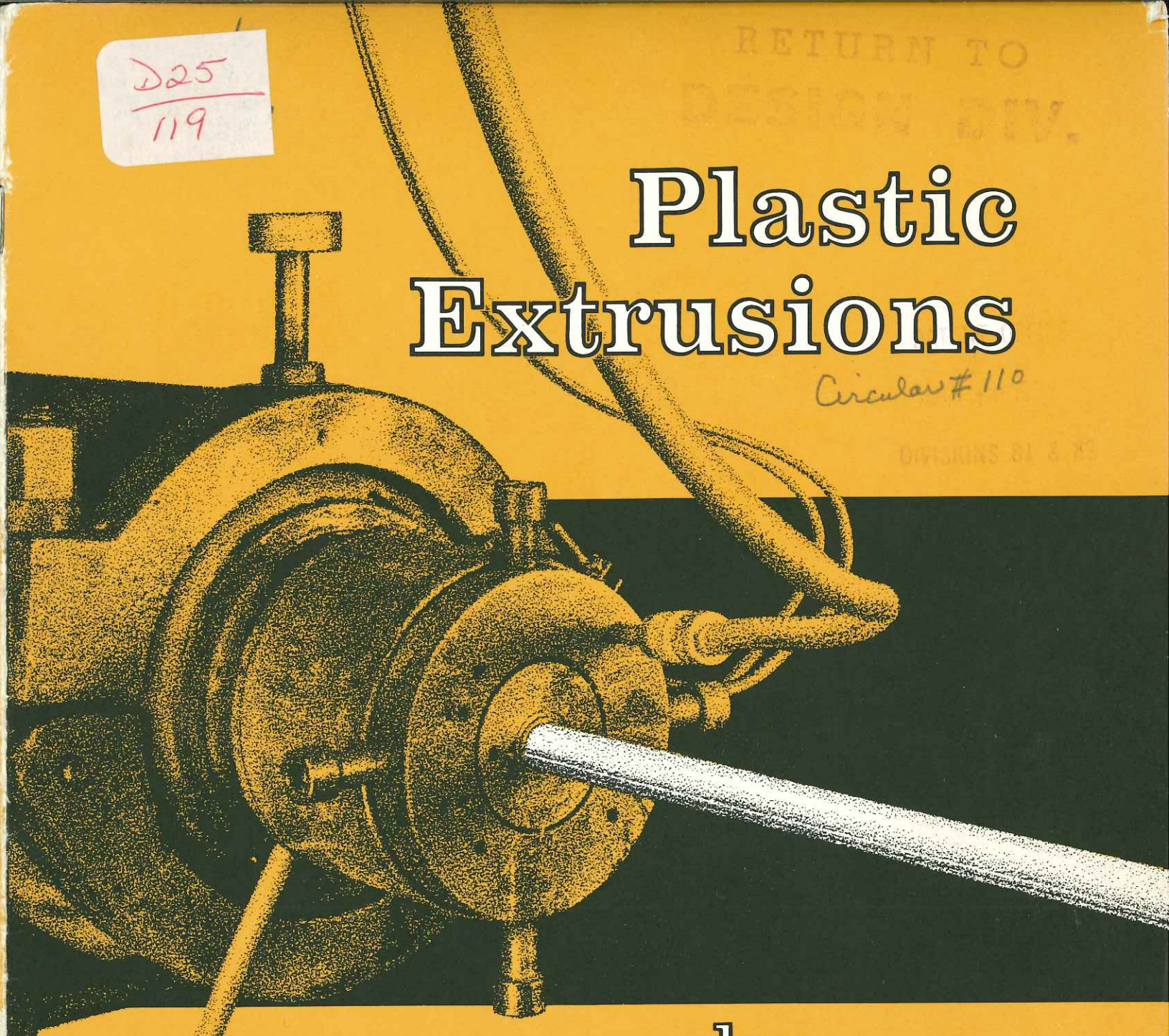
Plastic Extrusions



by

JESSALL

JESSALL PLASTICS

Division of The Electric Storage Battery Company

KENSINGTON, CONNECTICUT

...and for your use —

A NEW CHART OF THERMOPLASTIC PROPERTIES

. . . TO MEET YOUR PLASTICS ENGINEERING NEEDS

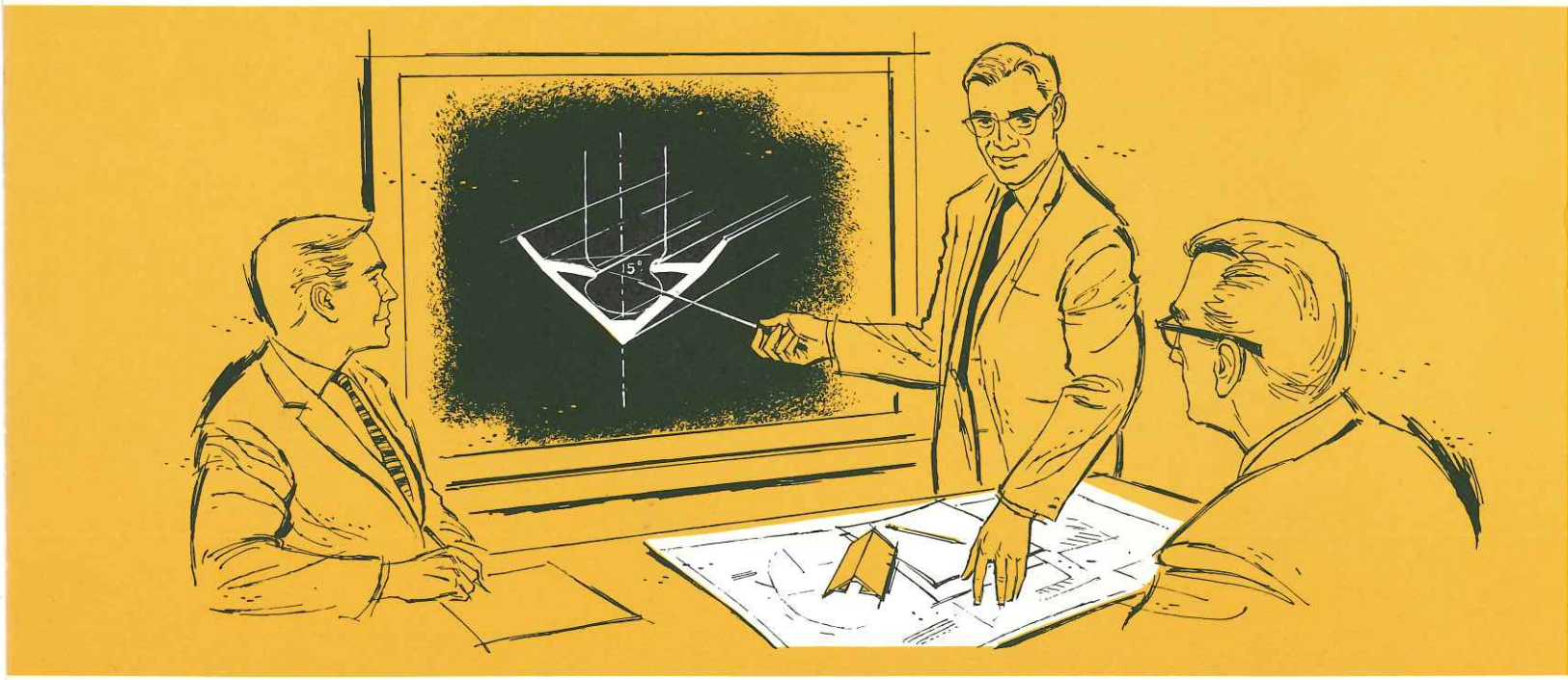
Creative Engineering

Today's creative Design and Development Engineers are taking full advantage of the new and different properties of plastic materials to improve the quality and lower the cost of their products.

Each year, new plastic compounds offering unique and different properties are becoming available for your use.

Jessall Plastics' function is to assist you in designing your product or component in plastic, to select or develop the optimum plastic formulation, and to produce efficiently a high quality extrusion precisely to your specifications.

Our sales engineering and production people are available to consult with you at any time, without obligation, to discuss your product and its design in plastic.

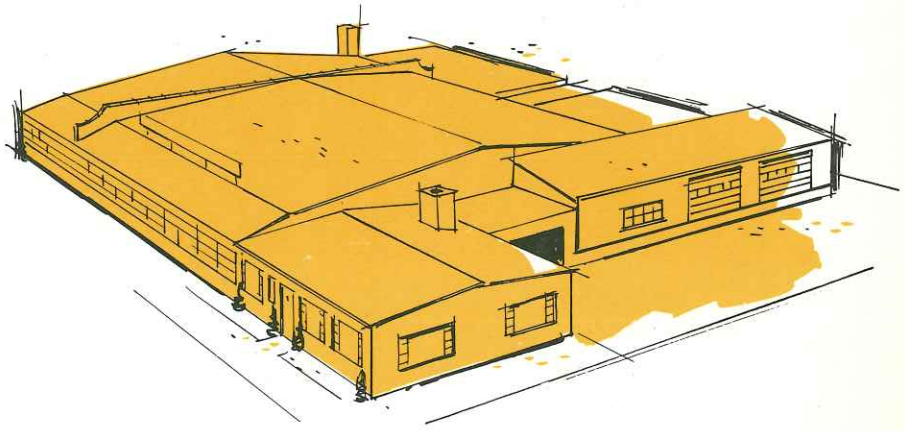


Modern Facilities . . .

AT YOUR SERVICE

You are cordially welcome to visit Jessall's plant at any time to review your problems and new designs with our staff.

The pictures on the facing page were taken to present to you a visualization of our organization and our ability to design and produce for you.

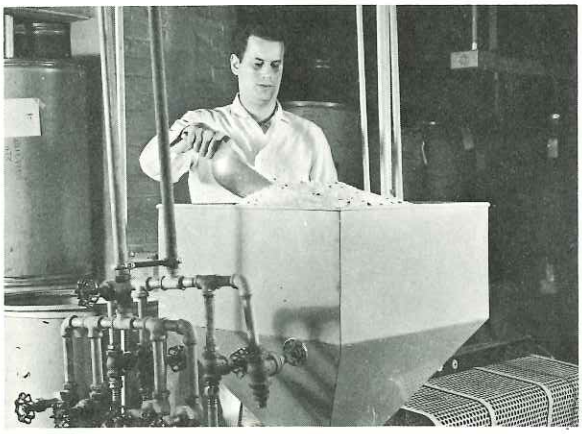


PRODUCT DESIGN DEPARTMENT . . . is staffed by skilled, experienced specialists who can translate your ideas into designs that insure finished parts or products that will perform according to your specifications.

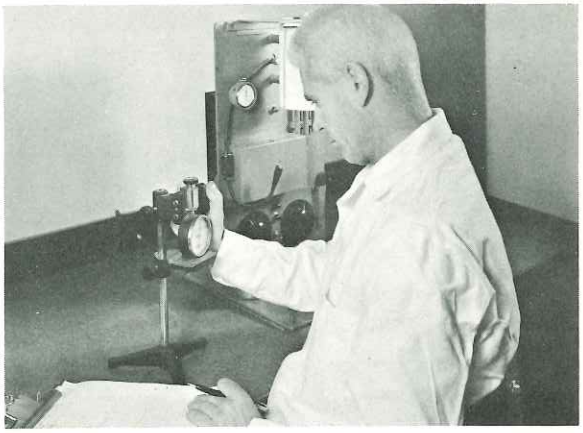
METHODS and PLANNING DEPARTMENT . . . determines the correct choice of extruders and equipment to produce your extrusions . . . and follows through to make sure that all operations stay on schedule.

TOOL ROOM . . . is fully equipped with the modern high-precision machine tools required to produce our extrusion dies and other special tooling. Our toolmakers thoroughly understand the specialized die requirements of the plastic extrusion process.

ADEQUATE RAW MATERIAL STOCKS . . . which include a wide variety of thermoplastic compounds, are maintained at all times . . . eliminating delays in filling your orders.



PRODUCTION DEPARTMENT . . . employs advanced-design extruders that cover a wide range of sizes. Equipped with the latest electronic controls, these machines are operated by skilled, experienced personnel.



QUALITY CONTROL . . . . at Jessall is a complete, fully-integrated *system* applied to every step in the production process . . . from design of the extrusion die . . . through in-process inspection . . . to final checking and testing of the finished extrusions.

New Custom Profiles

Every month, Jessall sees new applications for plastic custom profiles. Now, Design Engineers are specifying plastic extrusions for many components previously produced from conventional materials such as metal, wood, rubber and glass.

Even more interesting is the constant stream of new products in plastic — products not previously possible with conventional materials, but now made practical and economical by the unique properties of modern plastic polymers and extrusion techniques.

Your Product in Plastic

Jessall's people have the invaluable skill, experience and know-how to design, develop and produce efficiently your product in plastic. Jessall's modern equipment and high quality-control standards assure an extrusion of consistently high quality.

YOUR CHOICE OF

Thermoplastic Compounds

Jessall has had wide experience with all of the thermoplastic compounds and can select the correct compound to give you the optimum combination of physical and chemical properties for your application at the most economic price.

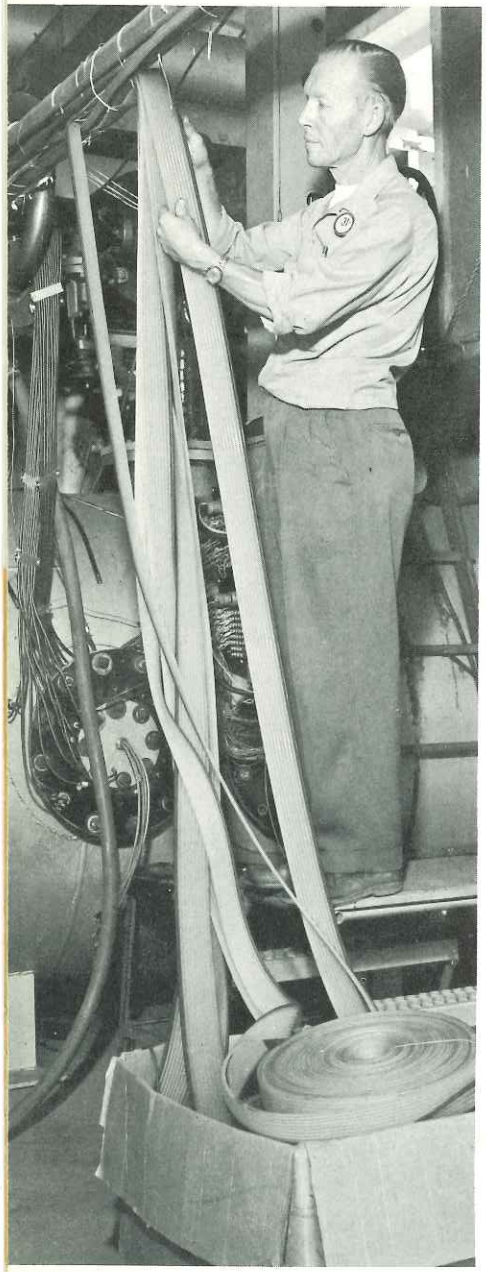
PLASTIC COMPOUNDS EXTRUDED BY JESSALL INCLUDE:

Polyethylene
Linear Polyethylene
Polypropylene
Flexible Polyvinyl Chloride
Rigid Polyvinyl Chloride
ABS Polymer
Acetate
Butyrate
Ethyl Cellulose
Normal Polystyrene
High Impact Polystyrene
Acrylic
Nylon
Acetal

New Plastic Compounds

FOR YOUR PRODUCT

Jessall Plastics works in close cooperation with most of the leading manufacturers of thermoplastic compounds — and through this cooperation can bring the benefits of their vast development and customer service laboratories to your assistance. Hence, with Jessall you are assured that the newest and the best plastics and extrusion techniques for your applications are available to you at no extra cost.



Strip-a-Tube®

Strip-a-Tube consists of multi-cell flexible vinyl tubes extruded together in a flat, tape-like form. As the name implies, the individual tubes are easily separated from one another, providing complete flexibility of installation in addition to unusual compactness. Strip-a-Tube is supplied in a clear, high-burst-strength compound.

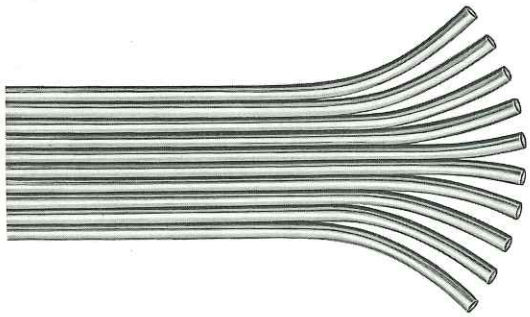
It is also available color coded with translucent colors, each tube a different color.

The high-quality virgin vinyl compound used in Strip-a-Tube is self-extinguishing and is impervious to acids, alkalies, organic solvents and most liquids and gases.

STRIP-A-TUBE APPLICATIONS

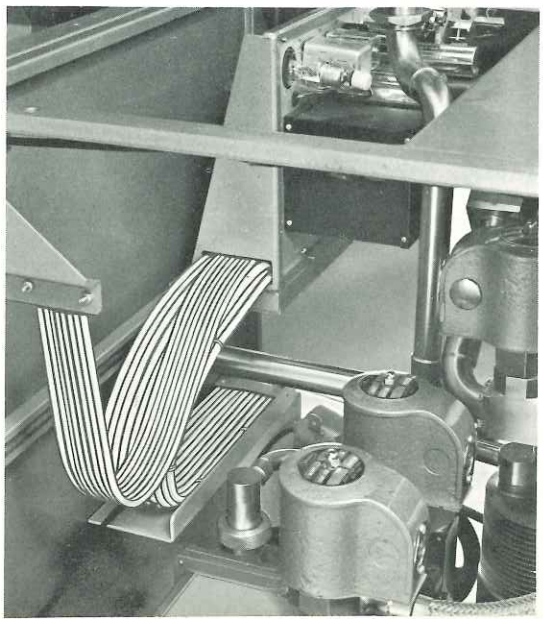
WIND TUNNEL RESEARCH—AIRCRAFT and MISSILE — Strip-a-Tube was originally designed for multi-pressure and vacuum measurements in aircraft and missile wind tunnel development and has been used extensively in this application for more than 12 years.

ELECTRONIC HARNESSES — Strip-a-Tube is used in electronic consoles as "Harness" for a system of insulated conductors where neatness, protection, and/or capacitance requirements are important.



PRESSURE MEASUREMENT AND CONTROL — Strip-a-Tube is very valuable for multi-pressure or vacuum measurements in development work or as a component of an automated system for pressure actuated control.

LIQUID AND GAS DISTRIBUTION SYSTEMS — Strip-a-Tube can be used in industry or research wherever a neat, compact and systematized installation of gas or liquid distribution is required.



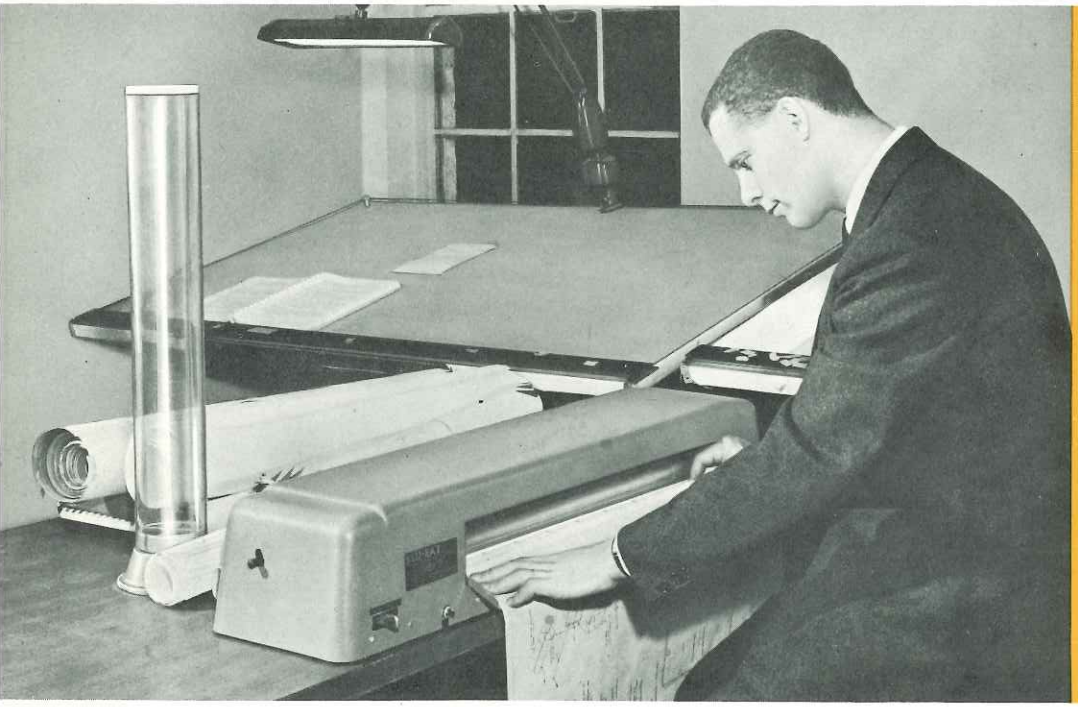
Jessall's Custom-Extruded Large-Diameter Clear, Rigid Tubing

Jessall's extruded tubing offers you several distinct advantages over conventional molded tubing:

- It costs far less.
- Extruded to your exact diameter and wall specifications.
- Cut to the precise length you require.
- Supplied in the thermoplastic best suited to your requirements.

Acetate - Butyrate - Polystyrene - Acrylic

The transparent plastic tube (vertical tube in picture below) is an important feature of this "Blu-Ray" white print machine for reproducing engineering drawings, allowing the operator to watch the print as it develops.



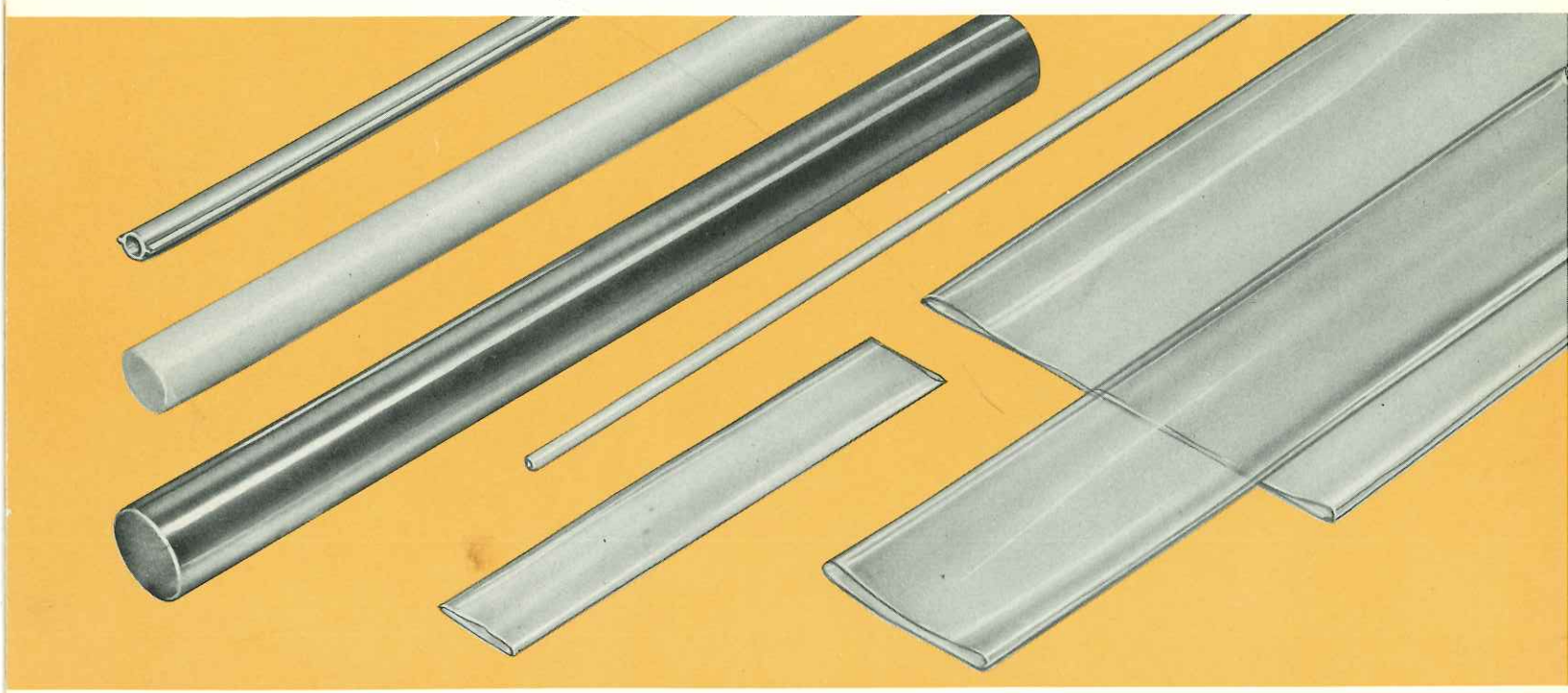
Jessall extrudes this tube to the precise dimensions specified by the manufacturer, Reproduction Engineering Corporation of Essex, Connecticut.

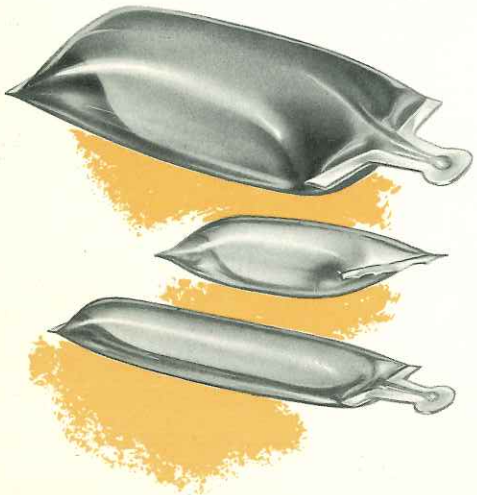
Custom Rod and Tubing

Jessall is equipped to custom-extrude plastic rod or tubing to your precise dimensional tolerances, physical properties and other specifications.

If you have a problem that may be solved by plastic tubing or by a part produced from plastic rod, Jessall can help you choose the right compound and extrude it to meet your exact needs.

Custom Rod and Tubing can be supplied cut to precise lengths, in mill lengths, in coils, or on reels.





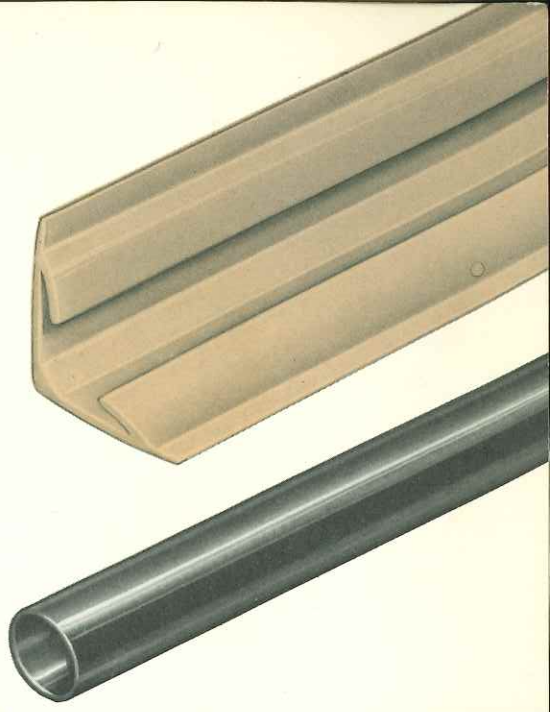
"Layflat" Tubing

"Layflat" tubing is available in widths up to 5" with wall thicknesses from .006" and up. It is extruded from polyethylene or flexible polyvinyl chloride, both of which can be readily heat sealed.

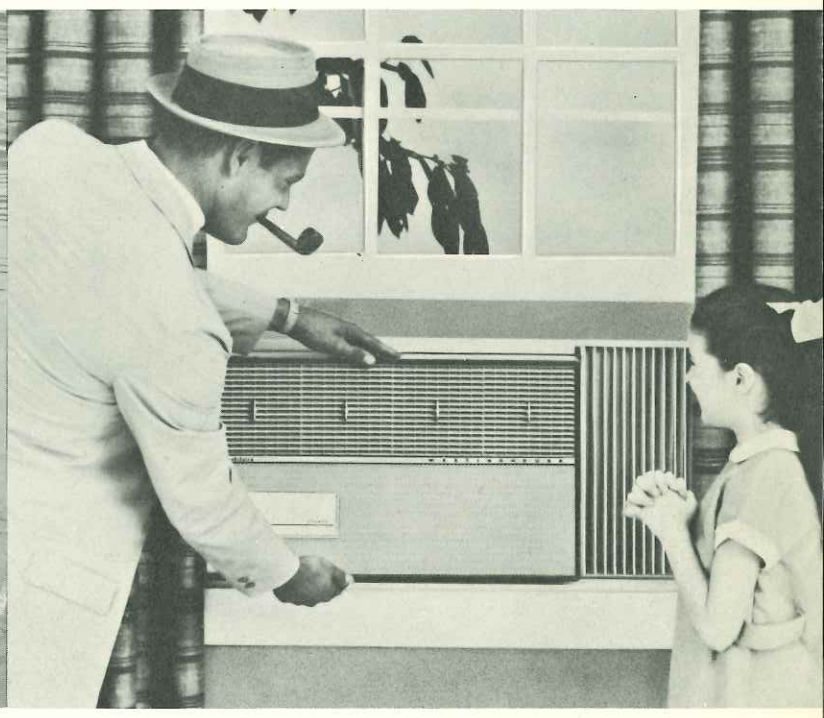
"Layflat" is providing the ideal answer to heavy-wall packaging problems for food, drugs, hardware, cosmetics, metals, liquids, and other products. It is also used for irrigation, metal tube protection, medical equipment and other applications.

SOME OUTSTANDING

Application-Engineered Extrusions by JESSALL



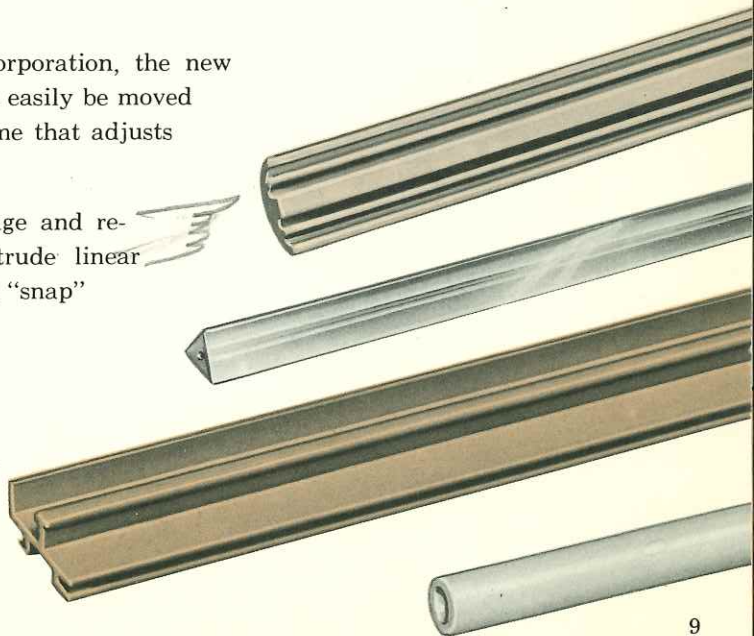
When Clark Metal Products, Inc., wanted to produce a new and improved type of bilge pump for small pleasure and commercial craft, Jessall was asked to collaborate on this project. Working in close cooperation with this company, Jessall engineers helped develop the all-plastic "THIRSTY-MATE PUMP" shown here. The body and handle stem are extruded from rigid polyvinyl chloride. Other parts are molded from both flexible and rigid PVC. This pump is small in size and light in weight, but extremely strong and efficient. Not affected by salt water, oil, gasoline or solvents, it will never corrode or rust.



An outstanding product of Westinghouse Electric Corporation, the new "MOBILAIRE" Conditioner shown at right above, can easily be moved from room to room and slides into an installation frame that adjusts to fit into the window sash.

To support the weight of this unit, prevent air leakage and reduce vibration, Westinghouse required a hard-to-extrude linear polyethylene gasket of complex cross-section that would "snap" onto the bottom side of the frame.

Working in close cooperation with Westinghouse, Jessall's development force designed and extruded this gasket that successfully meets all of these exacting specifications.



A SELECTION GUIDE TO THERMOPLASTIC

Properties	ASTM Test Method	Polyethylene (Low Density)	Linear Polyethylene (High Density)	Polypropylene	Polyvinyl Chloride (PVC)	Rigid PVC	Acrylonitrile Butadiene Styrene Copolymer
Specific Gravity	D-792	0.910 - 0.925	0.941 - 0.965	0.90 - 0.91	1.16 - 1.35	1.35 - 1.45	1.01 - 1.10
Specific Volume, cu. in. per lb.	D-792	30.5-30.0	29.4 - 28.7	30.7-30.5	23.8 - 20.5	20.5 - 19.1	27.4 - 25.2
Tensile Strength, psi	D-638 D-651	1,000 - 2,000	3,500 - 5,500	4,300 - 5,700	1,500 - 3,500	5,000 - 9,000	2,500 - 7,000
Elongation, %	D-638	200 - 575	15 - 100	250 - 700	200 - 450	2.0 - 40	40 - 100
Compressive Strength, psi	D-695	—	2,400	8,500 - 10,000	900 - 1,700	8,000 - 13,000	2,500 - 10,500
Flexural Strength, psi	D-790	—	1,400	—	—	10,000 - 16,000	3,700 - 11,500
Impact Strength (Izod) [1]	D-256	>16	1.5 - 12	0.6 - 2.5	Varies [4]	0.4 - 20	0.9 - 9
Hardness, Rockwell	D-785	D41 - D46 Shore	D68 - D70 Shore	R85 - 95	Varies [4]	70 - 90 Shore	R60 - R110
Thermal Conductivity [2]	C-177	8.0	11 - 12.4	3.3	3.0 - 4.0	3.0 - 7.0	3.4 - 6.0
Thermal Expansion 10^{-5} per °C.	D-696	16 - 18	11 - 13	11	7 - 25	5 - 18.5	6 - 13
Resistance to Heat, °F Continuous	—	212	250	275 - 320	150 - 175	120 - 160	150 - 200
Heat Distortion Temp., °F	D-648	105 - 121 (66 PSI)	150 - 175 (66 PSI)	210 - 230 (66 PSI)	—	130 - 165	170 - 205
Dielectric Strength [3]	D-149	460 - 700	450 - 600	750 - 800	300 - 1,000	425 - 1,300	310 - 410
Dielectric Constant, 60 cycles	D-150	2.25 - 2.35	2.25 - 2.35	—	5.0 - 9.0	3.2 - 3.6	2.7 - 4.75
Water Absorption, % [5]	D-570	<0.015	<0.01	<0.01	0.15 - 0.75	0.07 - 0.4	0.2 - 0.3
Burning Rate	D-635	Slow	Slow	Slow	Slow to Self-Extinguishing	Self-Extinguishing	Slow
Effect of Weak Acids	D-543	Resistant	Very Resistant	Very Resistant	None	None	None
Effect of Strong Acids	D-543	Attacked by oxidizing acids	Attacked slowly by oxidizing acids	Attacked slowly by oxidizing acids	None	None	Attacked by oxidizing acids
Effect of Weak Alkalies	D-543	Resistant	Very Resistant	None	None	None	None
Effect of Strong Alkalies	D-543	Resistant	Very Resistant	Very Resistant	None	None	None
Effect of Organic Solvents	D-543	Soluble in aromatic solvents above 60°C	Resistant (below 80°C)	Resistant (below 80°C)	Resists alcohols, aliphatic hydrocarbons and oils. Soluble in ketones and esters; swells in aromatic hydrocarbons.		Resistant and soluble in ketones, esters, and some chlorinated hydrocarbons.

[1] Ft. lb. per inch of notch (½ x ½ in. notched bar)

[2] 10^4 calories per sec. per sq. cm., per 1°C per cm.

JESSALL

COMPOUNDS...

Normal Polystyrene	High Impact Polystyrene	Cellulose Acetate	Cellulose Acetate Butyrate	Cellulose Propionate	Ethyl Cellulose	Methyl Methacrylate (Acrylic)	Nylon Type 6/6	Acetal (Delrin)*
1.05 - 1.11	0.98 - 1.10	1.24 - 1.34	1.15 - 1.22	1.18 - 1.24	1.09 - 1.17	1.17 - 1.20	1.09 - 1.14	1.425
26.2 - 24.8	28.1 - 25.2	22.4 - 20.6	24.0 - 22.7	23.4 - 22.7	25.5 - 23.6	23.7 - 23.1	25.5 - 24.2	19.4
7,000 - 12,000	4,000 - 6,500	1,900 - 8,500	2,600 - 6,900	2,000 - 7,000	2,000 - 8,000	7,000 - 9,000	7,000 - 10,900	10,000
1.5 - 2.5	10 - 60	6 - 70	40 - 88	45 - 60	5 - 40	3 - 10	90	75(extr.) - 15(inj.)
11,500 - 16,000	4,000 - 9,000	13,000 - 36,000	7,500 - 22,000	7,000 - 22,000	10,000 - 35,000	12,000 - 18,000	7,200 - 13,000	18,000
10,000 - 17,000	5,000 - 10,000	2,000 - 16,000	1,800 - 9,300	3,000 - 11,000	4,000 - 12,000	13,000 - 17,000	8,000 - 13,800	14 ,100
0.25 - 0.50	0.5 - 11	0.4 - 5.2	0.8 - 6.3	0.5 - 6.0	2.0 - 8.0	0.4 - 0.5	1.0	2.3(extr.) - 1.4(inj.)
M65 - M90	R50 - 100 M65 - M70	R35 - R125	R30 - R115	R20 - R115	R50 - R115	M85 - M105	R111 - R118	M94, R118
1.9 - 3.0	1.0 - 3.0	4 - 8	4 - 8	5.28 - 5.36	3.8 - 7.0	4 - 6	5.2 - 5.8	5.5
6 - 8	3.4 - 21	8 - 16	11 - 17	11 - 17	10 - 20	5 - 9	10 - 15	8.1
170 - 200	140 - 175	140 - 220	140 - 220	155 - 220	115 - 185	140 - 190	270 - 300	185 - 250
180 - 235	148 - 200	110 - 205	115 - 200	110 - 180	115 - 190	160 - 195	300 - 360 (66 PSI)	338 (66PSI)
400 - 600	300 - 600	250 - 365	250 - 400	300 - 450	350 - 500	450 - 550	385 - 470	465
2.45 - 3.4	2.45 - 4.75	3.5 - 7.5	3.5 - 6.4	—	3.0 - 4.2	3.5 - 4.5	4.1 - 4.6	3.7
0.05 - 0.4	0.1 - 0.3	1.9 - 6.5	0.9 - 2.2	1.2 - 2.0	0.8 - 1.8	0.3 - 0.4	0.4 - 1.5	0.12
Slow	Slow	Slow to Self-Extinguishing	Slow	Slow	Slow	Slow	Self-Extinguishing	Slow
None	None	Slight	Slight	Slight	Slight	Practically nil	Resistant	Resistant to some
Attacked by oxidizing acids	Attacked by oxidizing acids	Decomposes	Decomposes	Decomposes	Decomposes	Attacked only by oxidizing acids	Attacked	Attacked
None	None	Slight	Slight	Slight	None	Practically nil	None	Resistant to some
None	None	Decomposes	Decomposes	Decomposes	Slight	Practically nil	None	Attacked
Soluble in aromatic and chlorinated hydrocarbons	Soluble in aromatic and chlorinated hydrocarbons	Soluble in ketones and esters. Slightly soluble in alcohol. Little affected by hydrocarbons.	Soluble in ketones and esters. Slightly soluble in alcohol. Little affected by hydrocarbons.	Soluble in ketones and esters. Slightly soluble in alcohol. Little affected by hydrocarbons.	Widely soluble	Soluble in ketones, esters and aromatic hydrocarbons	Resistant to common solvents	Excellent Resistance to practically all solvents

[3] Short-time, ⅛ in. thickness, volts per mil [4] Varies widely with type and percent plasticizer [5] 24 hr. test, ⅛ in. thickness

Plastics

Reprinted in part from **Modern Plastics Encyclopedia**

*T.M. Reg. duPont

Send Us Your Specifications, Your Parts Prints, or Simply Your Ideas . . .

Whether it's standard extrusions or custom designs developed for your new products . . . *Jessall wants your business.* We believe we can give you the expert engineering service and the product quality you desire.

Write now for more complete information, outlining your plastics requirements. If you prefer, call in person and discuss your applications with our engineers at Kensington, Connecticut . . . or telephone VAlley 8-3526.

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Division of THE ELECTRIC ESB STORAGE BATTERY COMPANY

KENSINGTON 4, CONNECTICUT

Circular No. 110

Printed in U.S.A.